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GRATTING
AND
BUDDING



CHARLES BALTET

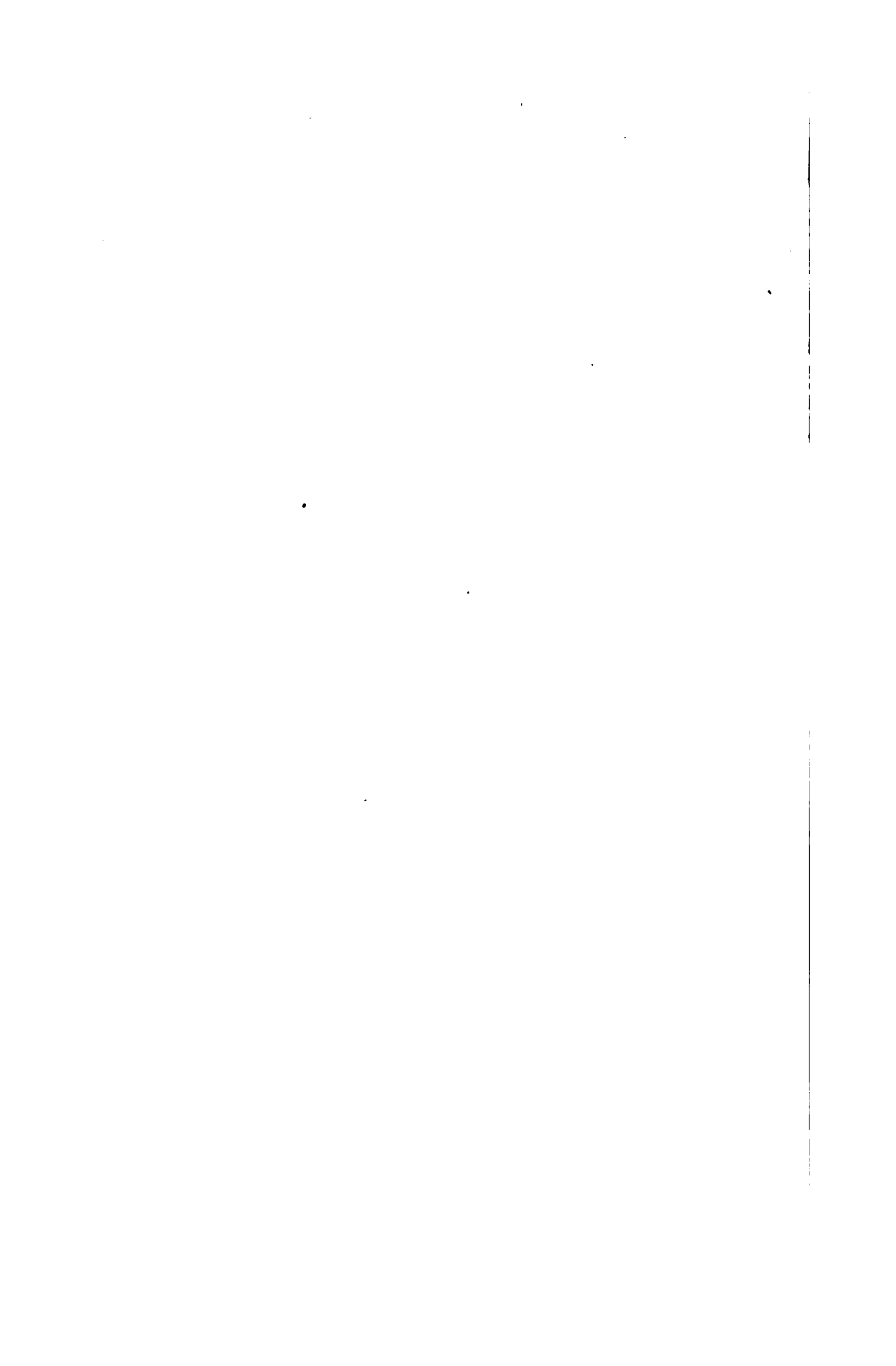


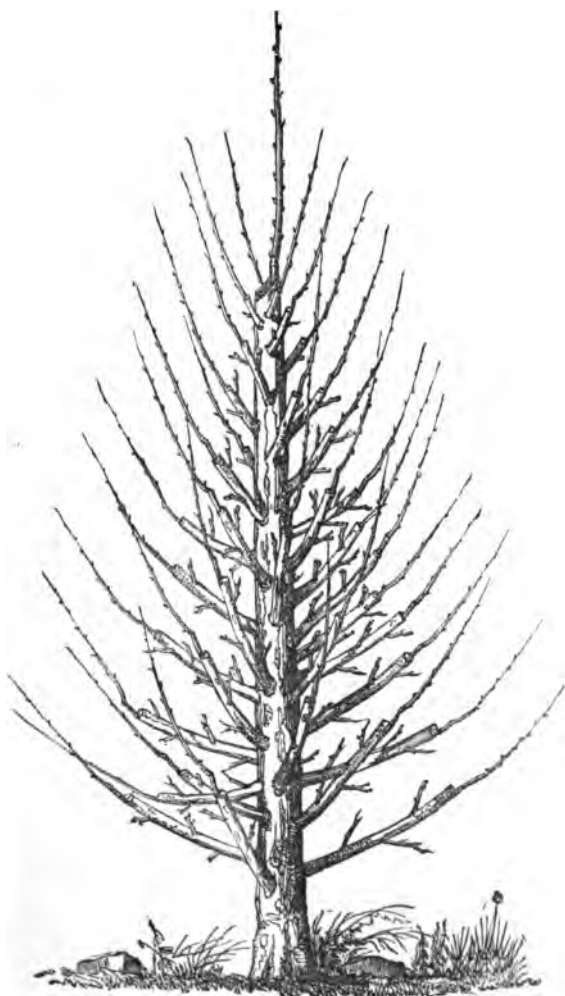


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THE ART OF GRAFTING AND BUDDING.





Pyramidal Pear-tree regrafted (see p. 220)

THE
ART OF GRAFTING
AND
BUDDING

By CHARLES BALTET

TRANSLATED FROM THE FRENCH

With upwards of One Hundred and Eighty Illustrations

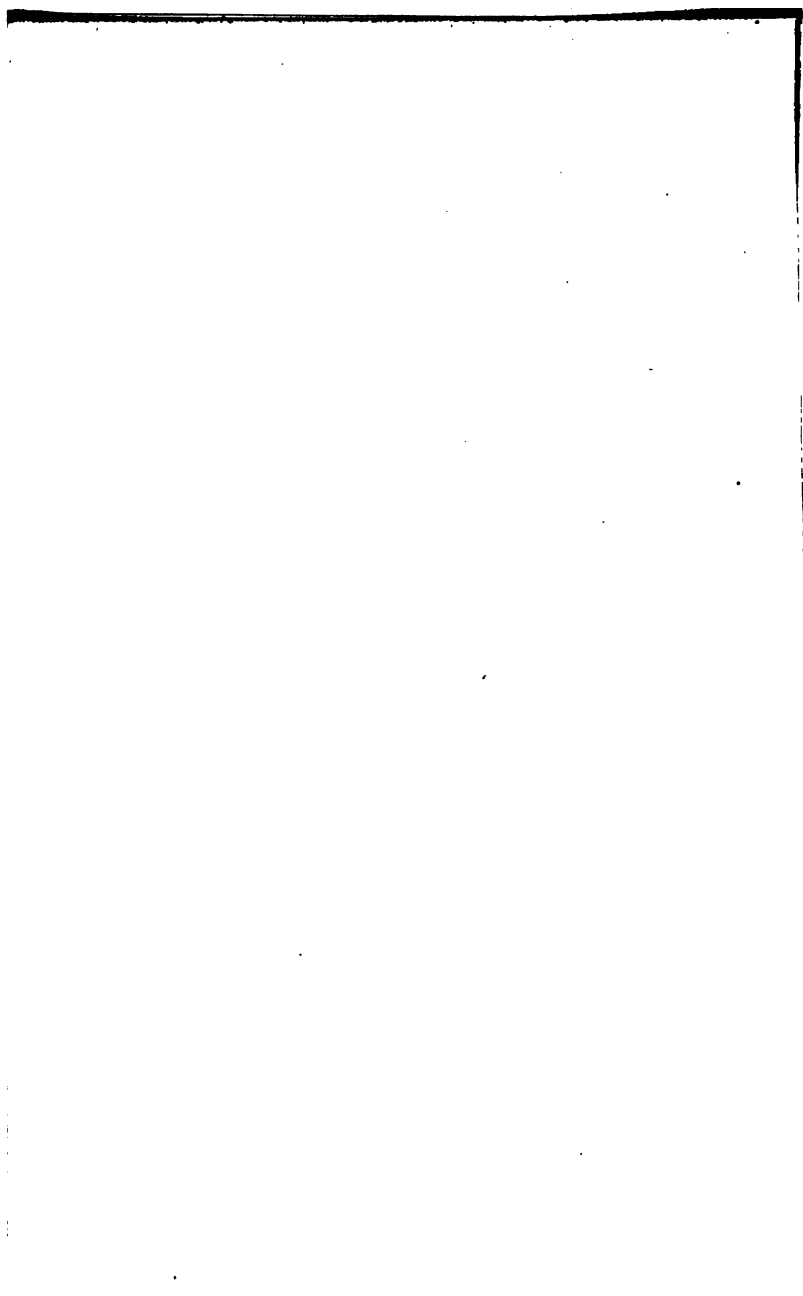


LONDON
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7, STATIONERS' HALL COURT, LUDGATE HILL
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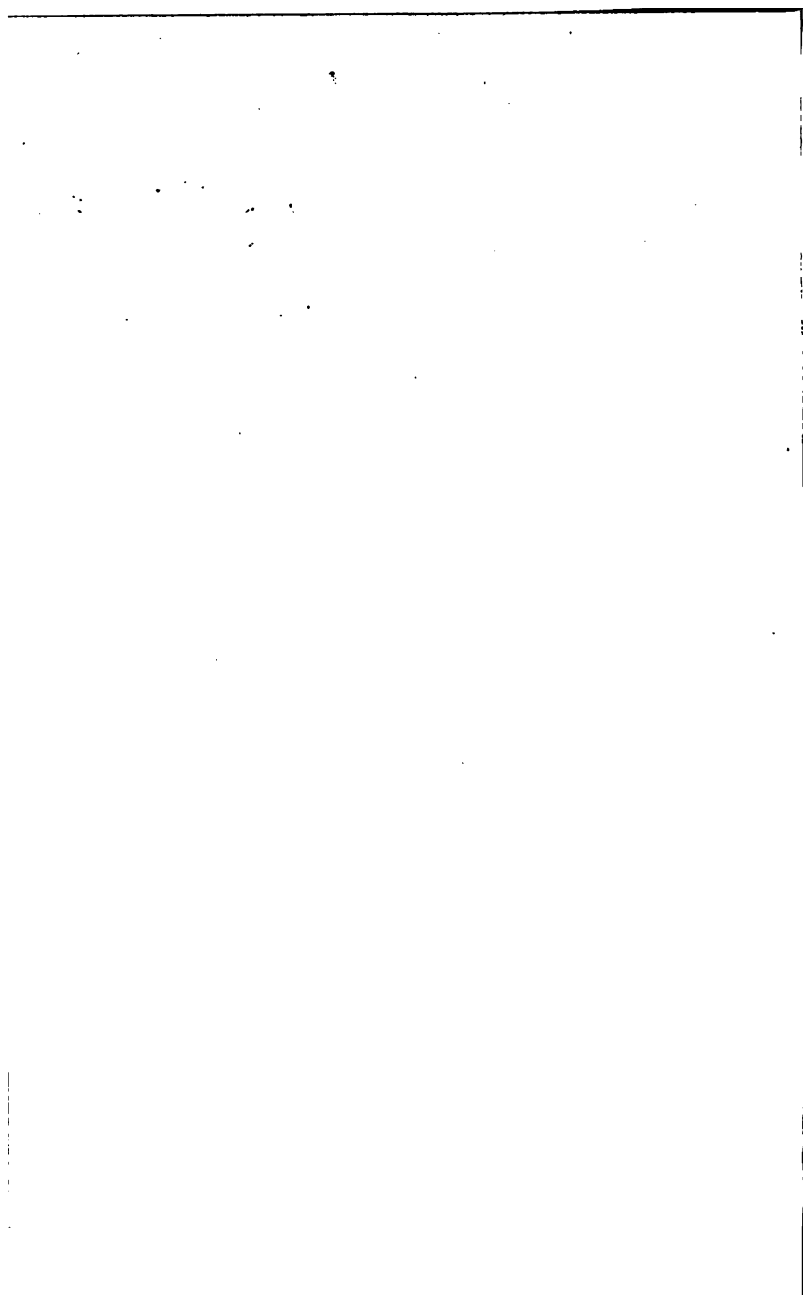
P R E F A C E

THE art of Grafting and Budding has for many years been practised in France on such an extensive scale, and with such remarkable success, that the gardeners of that country are now far in advance of all others in this branch of horticulture. The present work is a translation of M. Charles Baltet's "*L'Art de Greffer*," and embodies all that is known on the subject, so that the reader will find in its pages the fullest information on every point which relates to these operations. Every method of Grafting and Budding is described at length, with numerous illustrations, and an enumeration of the trees, shrubs, &c., to which each mode of operation is best applied. The book concludes with a practical application of the previous instructions to about a hundred various kinds of trees and shrubs, which are then more particularly mentioned, with the season and mode of grafting proper in each case, special observations being added when necessary. M. Baltet is well known in the horticultural world as one of the most experienced fruit-growers on the Continent, and his "*L'Art de Greffer*," or "*The Art of Grafting and Budding*" is the most complete manual of these operations that has yet appeared in any language.



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THE ART OF GRAFTING AND BUDDING.

"You see, sweet maid, we marry
A gentle scion to the wildest stock;
And make conceive a bark of baser kind
By bud of nobler race; this is an art
Which does mend nature: change it rather: but
The art itself is nature."—SHAKESPEARE.

DEFINITION AND AIM OF GRAFTING.

GRAFTING is an operation which consists in uniting a plant, or a portion of a plant, to another which will support it, and furnish it with a part of the nutriment necessary for its growth. The plant which receives the graft should be furnished with roots; it is destined to draw nutriment from the soil, and transmit it to the part grafted. It is called the stock. We shall mention a few exceptions where the stock is a simple cutting without roots; but it is planted in such a manner as to be soon furnished with them. The other plant, or portion of plant, which is grafted on the stock, should have at least one shoot or eye, and be in good condition—that is, neither withered, nor mouldy, nor decayed, nor wet. It is called the graft or scion; it is analagous to a cutting in communication with the soil, and continues its normal growth through the intervention of the stock. Notwithstanding the intimate union of the stock and the graft, they preserve their

individual character and constitution distinct: their layers of wood and bark continue to be developed without the fibres and vessels of one converging with those of the other. It is, as it were, a federative union which leaves to the interested parties their independence. Not unfrequently the union of the grafted pieces suffers a clean severance at the point of contact, either in consequence of the weight of the branches, the violence of the wind, or some other casualty. However, the parts thus broken may be used again, either as stocks or grafts, just as before. Almost all dicotyledonous plants may be grafted. Up to the present the monocotyledonous plants have been tried without success. Their structure does not present the least capacity for the adhesion of the parts when put together; and without this intimate union, grafting is impossible.

OBJECT OF GRAFTING.

The object of grafting is—1st. To change the character of a plant, by modifying the wood, the foliage, or the fruit which it was required to produce. 2nd. To excite the development of branches, flowers, or fruit on the parts of a tree where they are deficient. 3rd. To restore a defective or exhausted tree by the transfusion of the fresh sap of a vigorous kind. 4th. To bring together on the same stem the two sexes of monoecious plants, in order to facilitate their reproduction. 5th. To preserve and propagate a great number of woody or herbaceous plants for use or ornament, which could not be reproduced by any other means of multiplication. Without grafting, our orchards would not contain such rich collections of fruits for all seasons; our forests would be without a large number of important kinds of trees; and we should not experience the pleasure of seeing in our parks such a brilliant array of native and exotic shrubs. There remains one more observation to be made in favour of grafting, that is, that the

plant, or rather fragment of plant, grafted on another preserves its original qualities and characteristic properties. It will produce branches close or spreading, leaves purple or silvery, flowers white or rose-coloured, fruit large or small, early or late, exactly resembling the variety from which it was taken, and without being influenced by the neighbourhood of, or contact with, several similar kinds grouped on the same stock. We could also quote instances of plants which, when grafted, grow more vigorously than when on their own roots. When it is considered that grafting is easy to be practised, that it involves only a trifling degree of bodily exertion, and develops a love for gardening, it will be allowed that it is both a useful and an agreeable operation.

CONDITIONS OF SUCCESS.

In grafting, a great deal of the success depends on the skill of the operator. The other conditions essential to success are affinity between the species, vigour of the stock and graft, the condition of their sap, their intimate union, the season, and temperature.

Affinity between Species.

The laws of the affinities of species are almost unknown. The observations hitherto made have been undertaken in a practical rather than a purely scientific spirit, as in the fertilizing of plants. The results obtained up to the present can only be regarded as a matter of fact. No theory has as yet been deduced from them, except that kinds to be united by grafting must be of the same botanic family.

For instance, the peach and the apricot are grafted on each other with difficulty, while both do well on the almond-tree and the plum-tree. All the cherries unite with the Mahaleb; but it will not succeed as a graft on any of the cherries. The sweet chestnut prospers on the oak; but will not do so if

grafted on the horse-chestnut, which belongs to another family. The medlar and the quince, which have solitary flowers, flourish on the hawthorn, whose flowers are in corymbs. The *Chionanthus*, so nearly allied to the lilac by its paniced flowers and simple leaves, only succeeds well on the common ash and on the flowering ash, which have compound leaves. On the other hand, the *Sorbus*, with pinnate leaves, is more vigorous when grafted on the thorn, (whose leaves are more entire) than it is when grown on its own roots.

The grafting of evergreen trees on deciduous kinds presents more than one singularity.

The *Photinia*, allied to the beam-tree, and the *Eriobotrya*, allied to the medlar, are grafted on the medlar, and not on the hawthorn. On the last, as a stock, the *Cotoneaster* and the *Pyracantha* do well. The *Mahonia* flourishes on the *Berberis*, and the common laurel succeeds on the bird-cherry and even on the wild cherry, from which it differs so much in appearance.

The grafting of deciduous plants on those that are evergreen has, in almost every case, been attempted in vain. Those who are fond of oddities can, with the assistance of grafting, have on the same thorn stock at the same time fruiting branches of the pear, the medlar, the beam-tree, the service-tree, the mountain-ash, the European and Japanese quince, and also see there the flowers of the double and red thorns, the *Cotoneaster*, and the *Pyracantha*.

They may gather from the same plum stock plums, apricots, peaches, nectarines, almonds, the corymbs of the Canadian cherry, and flower garlands of the Chinese and Japanese plum. But these whimsicalities are unworthy the attention of cultivators.

Whoever wishes to study grafting in the works of celebrated ancient authors on horticulture will find a string of absurdities,

some of which we shall mention. Virgil speaks of a plum-tree which bore apples after having been grafted, and recommends the grafting of the pear on the ash. Martial advises the grafting of the cherry on the poplar. Columella, whose works are equally trustworthy, would have the olive grown on the fig. Palladius speaks of the walnut being grafted on the Arbutus, the pear on the almond, and the citron of his native island of Sardinia on the mulberry-tree. Pliny considers thunder injurious to trees grafted on the white-thorn.

Madame de Genlis, it is said, grafted the rose on the holly or the black currant, in order to obtain green or black roses; and the Abbé Rozier recognised the possibility of it. Others united, in their imagination, the apple to the briar, hoping to gather therefrom Calvilles; the orange to the holly, in order to acclimatize the former in open woods; the vine to the walnut-tree, so as to have grapes full of oil. They are merely so many hallucinations, like the story of a cornel grafted on a peach-tree in a garden at Troyes, published by M. de Caylus in his "History of the Conjunction of Plants." The ancients are not the only persons guilty of falsification in the matter of grafting. There have been many instances of it in our own time, and we shall long continue to hear of black roses being produced from a black currant stock, &c.

Mutual Vigour of the Parts.

It will always be better to unite by grafting only such subjects as have between them some analogy in point of vigour, time of commencing to vegetate, and hardness. If any difference should exist, it would be preferable that the graft should be of later vegetation than the stock, and also more vigorous and hardy. Tender varieties suit well with a stock of moderate vigour; but on a weakly stock they produce a worthless tree. When grafted on too vigorous a stock, it is difficult for them to absorb all the sap furnished by the roots; an evenness of

growth cannot be established between the stock and the graft. Then follow weakness and disease—disagreeable results. The reverse of this, to have the graft more vigorous than the stock, is more admissible. The pear-tree on the quince, the apple on the paradise, the cherry on the Mahaleb, give us proofs of this. The tree will be less vigorous than if perfect harmony existed between the two parts, and, its growth being thus tempered, it tends more to the production of fruit. Very great differences in the matter of vigour may be lessened by means of double grafting, in which we first graft on the stock a variety of intermediate vigour, and on this, later on, we graft the variety which we desire to propagate. The stock should always be strong enough to receive the graft. If it is weakly, although the graft will unite with it, the future tree will always be tender. Stocks that have been planted a year at least should be employed. The number of the grafts on each stock should be in proportion to its vigour, so as to obtain the favourable results which will follow from the exact adjustment of the powers of vegetation. Sometimes grafting is successfully performed, during the repose of the sap, on stocks taken up out of the soil, which are replanted immediately after grafting. The graft, on its part, should come from a pure source. The tree which furnishes it should be healthy, if it is desired to transmit health and hardiness. In the raising of plants, it is easier to prevent than to cure disease. The degeneration—more apparent than real—of species and varieties is especially due to the selection of bad subjects for propagation. The parent plant or tree which furnishes the scions should always be of a strong healthy constitution.

Intimate Union of the two Parts.

In every kind of grafting it is indispensable that the two parts grafted should be in close communication, not by means of the epidermis or the pith, but through the generating layers

—that is, the new and living layers of inner bark or alburnum, in the tissue of which the cambium flows. A perfect joining is not effected except on this condition. A multiplicity of points of contact is favourable to a more complete union, which will also be assisted by a similarity of texture between the scion and the stock, especially as regards the herbaceous or woody nature of their tissues. Lastly, the speedy cohesion of the parts depends on the skill of the operator, who should know how to avoid wounds, or to cicatrise them, and to preserve them from the action of the atmosphere.

Season for Grafting.

On principle, grafting should be performed while the sap is in motion. When it is done in spring or in autumn, the time should be chosen when the sap has begun to flow, or before it has ceased to do so. In summer it is best to avoid the period of its greatest activity. In all kinds of grafting, the condition of the sap should be nearly similar in both scion and stock; when it is not so, it is much better to have the scion in a less advanced stage than the stock. The season of grafting in the open air is from the month of March till September, that is, generally speaking; in warm countries vegetation commences a month sooner. Certain plants also preserve the flow of the sap up to October and November, which permits a delay in grafting them until that time. The time most suitable for the different methods of grafting will be indicated further on when we come to describe each method. The tradition which ascribes greater vigour to grafts made at the time of new moon, and greater productiveness to those made at the end of the last quarter, we consider simply ridiculous. A calm atmosphere, and warm rather than rainy or cold, is both agreeable to the operator and conducive to the success of the operation. Heat, within certain limits, stimulates the nutritious fluid; while cold, on the contrary, chills

and benumbs it. During the frosts of winter, grafting cannot be carried on except in the shelter of the propagating-house, where artificial heat and the other arrangements of the horticulturist will bring on vegetation to the desired extent at all seasons. Grafting under glass, either in houses or frames or under the cloche, is constantly practised from January to March, and from July to September.

IMPLEMENTS AND APPLIANCES FOR GRAFTING.

Simple, handy tools, with well-steeled blades, and kept in good condition, are preferable to complicated implements with several blades, or bristling with salient or cutting points, which may wound both the tree and the operator. The tool with a fixed blade is more firm in the handle, but one with a



The Sécateur.

closing blade is more easily carried in the pocket, the apron, the tool-case, or the basket.

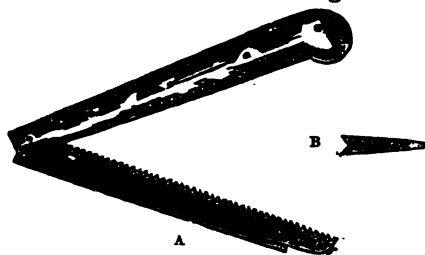
The Sécateur.

This is an implement formed with two arms of steel or iron, one of which terminates in a cutting blade, the other in a blunt bevelled crescent, against which the branch to be cut rests. The handles being wide and roughened on the back are, in consequence, easier to hold and less fatiguing to the hands. The *sécateur* is used for the following purposes:—

1. For cutting off the heads of stocks which are too thick for the pruning-knife, and not thick enough to require the saw, in those modes of grafting which demand a preliminary shortening of the stock.
 2. For cutting off scions from the parent tree.
 3. After grafting, for cutting, above the scion, any stocks that have not been previously shortened, with the object of stimulating the development of the graft.
 4. For cutting off the heels of grafts made on the branches of the stock after a year's growth.
 5. For severing from the parent-tree scions grafted by approach.
 6. For pruning spine-bearing plants and trees.
- In general, the wounds occasioned by the sécateur require to be dressed with the pruning-knife.

The Saw.

Hand-saws, with either a fixed or closing blade, are used for



The Saw.

cutting strong branches and thick stocks for crown-grafting with a tall or a short stem, and for cutting off the heels of grafts made on the branches of the stock when they are dry or too thick for the pruning-knife or the sécateur. When a strong branch is to be sawn, the heavy branchlets above the place of incision should first be removed; this will render it